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ABSTRACT

Byra L4:1 is the Swedish research and development program in education. The authors, while basically enthusiastic about the center, suggest the following ways of improving its operation: explicate priorities for basic and applied research and development, fund all professors and docents for basic research of greatest interest to them, establish centers or coordinated multi-investigator projects for applied research on broad problem areas, strengthen technical support by sharing services, schedule inter-visitation program for institute professors, carry out systematic progress evaluation of projects, involve junior researches in anonymous review of research reports, initiate a school research abstracts series, insist on explicit conceptual frameworks for projects, and set up some development centers headed by permanent associate professors of development. Budget proposals by the Board of Education for school research in 1972-73 are appended. (JK)

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Comments on the Research and Development Program of Byrå L4:1*

Marvin C. Alkin and Mauritz Johnson

I. Overview

There are many ways in which one might categorize a national educational research and development program. The Swedish R & D enterprise can be viewed within the context of the international community of researchers and developers in education, and from that standpoint foreign observers find it interesting and instructive not only to learn of the findings, products, and techniques generated by their professional colleagues in Sweden, but also to examine their organizational arrangements, funding practices, and management procedures. But while foreigners may concern themselves chiefly with a comparative analysis of the enterprise and the international significance of its contributions, Swedes must look at their educational research and development operation primarily within the context of their own society and educational system. They must continually ask such questions as whether the problems being studied and the products being developed represent the highest priorities within the educational system, whether the research findings are being adequately taken into account in policy formation, whether they are proving to be available when needed and useful and sound when

*This paper was jointly prepared by Professors Marvin C. Alkin (University of California, Los Angeles) and Mauritz Johnson (State University of New York, Albany). During the course of the three-month period, April to June, 1971, the authors visited nine of the twelve research institutes listed as recipients of funds in 1970-1971 from Byrå L4:1 of the National Board of Education. Most institutes were visited jointly, but in some cases only one author was present. In addition, visits were made with Byrå UA:1, UA:2, L4:2, and L4:3 of the National Board of Education. One or both of the authors consulted with the research and development office of the University Chancellor and with a major private educational product firm, and obtained information about the state-owned printing company. This paper represents their view of the research institutes in Sweden, based on their observations during this visit.

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available, whether developed products are being adopted in the schools and with what success, and whether research results and innovative developments are being incorporated into teacher training programs at both the pre-service and in-service levels.

Although systematic educational R & D is of comparatively recent origin in Sweden and has undergone extremely rapid growth, it is not difficult for a visiting observer to note numerous impressive strengths. Perhaps most notable is the competence of the people involved, both at the national level and at the institutes, from the established leaders to the young beginning scholars. Policies, procedures, and organizational patterns can readily be changed, but competent people are not so easily obtained. Another strength lies in the working relationships that exist among people in various agencies and institutions: between the research bureau and the operating departments within the National Board of Education, between the NBE and the Universities' Chancellor's office, between institutes at adjacent universities and schools of education, and between pedagogical researchers and academic scholars in those institutions. Additional strengths could be cited in the longitudinal and analytic approaches of particular research projects, in some extremely interesting development activities concerned with the individualization of instruction, in the efforts to refine the follow-up evaluations of recent school reforms, in the field experimentation with open and non-graded school organizational patterns, and in the investigations of the impact of certain frame factors on curriculum development. Any suggestions or implied criticisms in this report should be viewed in the perspective of these many strong features and be weighed in the total Swedish social and educational context.

It is commonly assumed that research will contribute to the improvement of practical operations. When research findings are not applied in practice, researchers and practitioners tend to blame each other, and outsiders blame both groups. But actually neither group should be blamed, because the fact of the matter is that research cannot be applied directly to practice. Whether the research is "conclusion-oriented" and concerned primarily with achieving a better understanding of a particular set of phenomena or is "decision-oriented" and directed toward the solution of a particular problem, any effects its results have on practice must be achieved primarily through the development of new policies, products, and procedures. In the field of education, the process of development has been generally neglected, and mechanisms for it are often inadequate, if not completely lacking. In this report, little, if any, attention is given to the impact of research and development upon educational practice, but the discussion does concern itself with both research and development, as well as the relations between them. Thus, if it is assumed that the rational improvement of educational practice depends upon the effective functioning and coordination of four processes--research, development, diffusion, and the implementation--our concern here is chiefly with certain aspects of the first two and to a lesser extent of the third.

The organization of this report is such that certain features of the R & D system as a whole are discussed first, and then some additional comments are offered about research and about development, separately. The features of the total system chosen for consideration are the selection, funding, staffing, monitoring, and coordination of projects and the dissemination of their results.

II. The Research and Development System

A. Project Selection

The ways that projects are selected should bear some relationship to the government's objectives for research and development. That is, to be selected a project should in some specific respect be compatible with the general notion or function of research and development in a nation. We have seen documents that describe the number and range of projects presently undertaken by Byrå L4:1 in which activities are defined in terms of subject description categories. That is, projects are identified as dealing with "teachers" or with "students." While such a categorization is important, it seems more relevant at this time that a description of the research and development activities be made. In the examination of the research and development program of Sweden, we have noted what appear to be three major functions of that program:

1. Research related to general knowledge building - we will refer to this as "basic research";

2. Research related to the examination of a particular problem or problem area of interest to the National Board of Education - we will refer to this as "applied research";

3. Activities related to the development of curricula and instructional materials - we will refer to this as "development."

An additional function that seems to be apparent in the current research and development program is a concern for "research training." It should be noted, however, that this is not a function related to a particular project; rather it is one which is implied as a part of all projects.

We will not consider "demonstration" and "dissemination" as separate and unique functions of the program, as has been the case in some other countries, but will instead view them in the manner in which they are considered in Sweden, as a part of the responsibility of projects of various different types having

other functions. That is, a part of the basic and applied research responsibility is the dissemination of results. A part of the development responsibility is the demonstration and dissemination of resulting products.

We recognize that the functions just described are somewhat arbitrary and that many projects encompass several areas. Problem-related projects (applied research) will frequently be heavily involved in the area of general knowledge building or may occasionally move into the area of development as a consequence of the problem-related research activity. However, lack of evidence that different criteria are used for projects of different purposes, either in the selection or in the subsequent evaluation, leads us to recommend that the functions of the R & D program in Sweden be made more explicit and that the projects selected be designated in terms of the way in which they fit that explicit research and development policy.

The first matter to be decided is whether the three main functions of the current research and development program are to be maintained as the priorities of selection by Byrå L4:1 of the National Board of Education. Secondly, the relative priorities of each of these areas must be determined, perhaps at a level of specificity that would indicate the percentage of the total budget to be allocated to each area. For example, we have heard in Sweden the comment that Byrå L4:1 should not be involved in the area of basic research because other agencies are funding that activity and, beyond that consideration, the country is too small to afford such an investment. If this decision were to be made, it ought to be made explicit; and, if it is not the decision, that too should be made explicit. While this is a matter for policy determination by those engaged in the educational research and development enterprise in Sweden, our own opinion is that this is not a reasonable

direction. Swedish pedagogical researchers currently have an excellent international reputation which ought to be maintained. The percentage of the L4:1 budget to be allocated for the basic research area is, however, a policy question into which we will not presume to intrude.

The priorities in the research and development program having been determined and specified, there are different strategies of project selection related to each of the R & D functions. Let us examine, for example, the basic research function. If the priority is general knowledge building (basic research), then the areas of greatest pay-off are those represented by the main competence of the ten professors at the University and School of Education institutes. And, if these are the areas of greatest potential pay-off for investments in basic research, who is better qualified to state what research problems in those areas are scientifically most amenable to solution than the professors themselves? Thus, a possible strategy for the allocation of the basic research funds in the L4 budget is to provide up to one basic research grant per professor in topic areas of their prime interest. Such grants ought to be for a clearly stipulated amount and should be, in principle, long-term continuing grants with a minimum amount of control over project content by the National Board of Education. The rationale behind this potential strategy recognizes the academic selection system in Sweden and the intense competition for professorial positions. While the professor selection system may not be perfect, nonetheless it is probably as effective as any procedure that might be devised at the National Board of Education for determining who the best educational researchers in Sweden are. In order to assure the personal attention of the eminent scholars for whom this program is intended, professors should be limited, in applying for basic research grants, to only one topic related to their prime interest, with the stipulation that they act both as scientific leader and project director for that project and spend a specified minimum percentage of their time on the project.

In the event that a professor does not desire to participate in the program, funds unused for basic research purposes might be designated for receipt by other qualified scientific leaders. Alternatively, a small portion of the basic research funds might be set aside for allocation by this secondary strategy. Those at the docent level could compete among themselves for these available basic research funds on the basis of detailed proposals. The conditions relative to long-term funding and minimum NBE control over project content might be the same, with the same stipulation that the docent be both the scientific leader and project director.

We have pointed to a potential strategy for contracting for good basic research work. There are perhaps other strategies that are more appropriate for applied research or for development. Applied research, as we have defined it, deals with a particular problem or problem area that is of concern to the National Board of Education. In some cases, the National Board of Education might state the dimensions of the particular problem as clearly as possible and solicit research proposals from the field.

Alternatively, if the problem is broad (let us say a general problem area), then it might be appropriate to try new organizational forms for the accomplishment of the research and development work. For example, Byrå L4:1 might establish a "center" to study a particular area with long-term funding appropriate to the importance attached to that problem area. A center might be characterized as a relatively long-term programmatically related research enterprise involving several scholars (docent competence). The procedure for selecting the site and staff of a center might rest upon formal proposals--well-written and fully documented--with time schedules listing research products, etc. Proposals might be judged on the

basis of the quality and completeness of the plan, adequacy of the manpower (with preference to multiple-scholar proposals), and perhaps on the integration of applied research and development, if this is desired by the National Board of Education.

Again we would like to point out that these proposals merely represent an attempt at indicating one possible strategy that might be employed for each kind of R & D emphasis (a strategy for development will be recommended in a later section). What is more important than the specific suggestions made here is the recognition that the activities of Byrå L4:1 are of different types and that their requirements differ so much that it is necessary to make more explicit the research and development priorities or the Byrå in order to consider in a more systematic fashion the specific strategies for achieving each kind of priority.

B. Project Management

The problems: Some scientific leaders are "responsible" for a great number of projects at one time. In some cases they seem to be unaware of the activities of some of their projects. Indeed, there even seems to be a difference of opinion as to what the "responsibility" of scientific leaders is. At one institute we were told by an administrator that "the scientific leader is not responsible directly for the project, he is more of a consultant." We were told at another institution that the conception of the scientific leader as legally responsible for a project is also fallacious--the school rector has the responsibility. These views do not seem to be synonomous with those held by leaders of the National Board of Education.

Who does head projects? By and large, projects are managed by young researchers who hold fil.lic. degrees and are engaged in doctoral study, or by lectors who have achieved a fil.lic. but are not working towards a higher degree. The latter category of lectors generally have been relieved of their regular teaching responsibilities in order to assume research roles.

Table 1.

R & D Project Leadership

	Scientific leader is project leader	Scientific leader not project leader	Total number of projects
Total	13	38	51
Professors	7	25	32
Other scientific leaders	6	13	19

Source: School Research 1970:10 "Project List: Fiscal Year 1970/71."

The data in Table 1 were obtained by an analysis of the fiscal year 1970/71 projects listed in School Research, 1970:10. In only thirteen of the 51 projects listed was the scientific leader also the project leader. If one examines only those projects for which a professor is the listed scientific leader, then the disparity is even greater: of the 32 such projects, in only seven is the scientific leader also the project leader. (This averages out to about one project per professor, which corresponds very closely to the strategy for funding basic research proposed in an earlier section.) But the more interesting data are the 25 other projects which are headed by project leaders other than the professors. It is perhaps safe to conclude from the data that professors have the tendency to act as "holding companies" for projects they will not closely supervise. Further information that would be interesting to examine in juxtaposition with the above, but which is not available to the authors, is the number of other projects (other

than those supported by NBE) headed by professors at institutes. The addition of such data might provide even stranger evidence of the indicated tendency.

At present, when Byrå L4:1 funds a project that is to have a project leader other than a scientific leader it generally does not know what it is going to get or the quality of that project. The examples that we have seen are mixed and one can by no means generalize solely from the scientific leader-project leader correlation. For example, we saw one project where, even though the scientific leader was not listed as project leader (he had one other L4:1 project), he was very actively involved in heading up the project. The influence of the scholar was apparent in the daily work of that particular project. In another example, the scientific leader had been active at an earlier time but was no longer heavily involved, and under the new leadership of younger researchers the project had undergone a 180° shift in its approach.

The question in all of this discussion concerns not so much the quality of a project at the present time, as the principle that the National Board of Education ought to know what it is going to get when it funds a project.

Question: How do you prejudge the quality of a project? We would maintain that either one "bets on the man" or one "bets on the plan." If a given professor is going to do a job and be personally involved, there is usually no doubt about the quality of the work. On the other hand, if the project is not to be a major commitment of a known scholar, then how can the National Board of Education decide on proposals that would be led by younger researchers whose reputations have not been established to the same extent? The criteria have already been mentioned: the plan, its completeness, how well it is conceptualized, its feasibility and the past work of the project leader.

C. Personnel and Staffing

In this section we will discuss three major problem areas and then propose some strategies related to each. These areas are:

1. Second-level personnel
2. Technical back-up
3. In-service training.

In their earlier report on educational research in Sweden (School Research 1970:13) Passow and Postlewhaite recommended "that the question of the size and competence of this 'second level' body of researchers be urgently reconsidered."

There is, however, great ambiguity as to what Passow & Postlewhaite meant by the term "second level" personnel. Some research institutes have viewed this as a call for the use of more fil.lic. personnel and lectors in positions of responsibility on research projects. Others consider the term synonymous with technical personnel. For our part, we view the recommendation as a call for the involvement of more docent-level staff on projects jointly with other docents or with professors.

Concurrent with the need for more second-level personnel is the notion that the nature of present research and development activities may frequently require very large-scale projects. The present pattern of having a large number of discrete projects may not be the most appropriate one in applied research for properly analyzing broad-scale interrelated data. Frequently researchers tend to act as though the variable(s) in which they are interested appear in splendid isolation. We believe that multi-variable research generally requires larger research teams, perhaps with each researcher especially interested in some phase or phases of the data.

Technical back-up activities seem to be just emerging in Sweden. If they are to operate effectively, research organizations need to have available programmers,

key-punch personnel, statistical and measurement consultants, test-item writers, editors, etc. Frequently such services can only be provided on a multi-project or institute level. Moreover, there seems to be little communication between technical staffs at various institutes. As a result, funds may be spent in developing computer programs that are already available at other research institutes.

The third problem area under this category of personnel and staffing relates to in-service training. It seems that students associated with research projects are exposed to only a limited number of professional viewpoints. In many countries students grow and develop by melding the ideas of several scholars with whose views they have come in contact. By the nature of the professorial system in Sweden, wherein there is only a single professor at an institute, this is possible only through the literature. That is, the student may modify the views of Professor X at his institute by the distinctions and findings noted in a book by Professor Y. Another factor militating against the provision of broad exposure to a number of professional viewpoints in Sweden is the apparent lack of mobility at middle and lower levels in the system. True, there is some mobility (but perhaps not as much as one might expect) in positions accepted at the professorial level. But below that level, the tendency is for Ph.D.'s to remain at the institute granting them the degree, thus perpetuating within that institute its particular "party line." Due to this imbreeding, fairly similar views tend to persist within each research institute.

We would like to offer several comments on the evolving situation and make a few recommendations. With respect to the participation of second-level personnel there appears to be a natural market condition working in favour of a solution. That is, the supply of, and demand for, qualified personnel may already be acting to create a natural solution of the problem. For example, we note three phenomena:

1. An increase in the number of newly qualified personnel -- we have no specific data on this but we see evidence at the various research institutes of many bright new Ph.D. graduates;

2. The current stability in the professorship -- there are now ten and will soon be twelve professors of education; judging by the ages of these men there is not likely to be a great deal of turnover in the next ten to fifteen years;

3. A stabilization in research funding -- indications seem to be that rate of increase in research and development funding is not as great as in recent years, lending some greater stability to the enterprise.

As funding stabilizes we would assume that more of the funds available will go to those docent-level researchers who are now acting both as scientific leader and project leader, those who are devoting a major portion of their personal time and experience to a particular project. We would imagine that concurrently the number of projects headed by scientific leaders who bear no responsibility for running projects will decrease.

The second area of concern mentioned in this section relates to technical back-up staffs. The support of technical back-up staff should be encouraged with preference given to technical staffs that serve multiple projects or an entire institute. Several possible mechanisms exist for this, including:

1. Providing a specific form of institutional funding from the National Board of Education for the purpose of support services;

2. Encouraging overlapping and related projects at the same institute in which certain technical services are to be shared; or

3. Allowing institutes to designate a small percentage of project budgets for certain shared central services (especially of a technical-support nature).

Our preference rests with the second and third of these alternatives. Relative to the third we would offer a caveat from the United States experience---beware of "creeping" overhead costs. Services provided as a part of the central service or overhead should generally not be duplicated elsewhere in the budget.

Frequently there is a tendency to provide certain services out of overhead. However as the overhead allowance becomes acceptable to the funding agencies, these services are no longer provided for and require separate budget allocations within the project itself.

We turn now to the last problem area mentioned above, in-service training. With the creation of technical back-up staffs on a multi-project or institute basis as mentioned previously, the availability of the personnel of these staffs should add immeasurably to the in-service training capacity of research institutes. For example, we were most impressed that one institute had hired a research methodologist (Ph.D.) as a member of their technical back-up staff and that he was conducting an in-service-training program which, although not officially a university course, was available to students on projects. We also envisage the possibility of data-processing seminars and computer-programming seminars that might be arranged on a non-credit basis and directed by computer programmers and other members of technical back-up staffs.

But, despite these achievements and possibilities, the professors themselves are the heart of any research training program. Having as an objective increasing the research training competency of research institutes and projects provided by L4:1, we would propose a regular program of professor visitation and guest lectures at other universities and schools of education. Such a program should be systematically planned, regularly scheduled, and recognized as a part of the normal responsibilities of accepting National Board of Education funds. Students need to be exposed <u>first hand</u> to a variety of views.

<u>D. Project Monitoring and Quality Control</u>.

We have spoken of the concern and interest of the National Board of Education in seeing that a proper mechanism is created and maintained to provide adequate

management and appropriate staff for its projects. A further area of NBE responsibility is to monitor projects in order to ensure some minimum level of quality. While some monitoring and quality control is always necessary, its nature and extent depend upon the type of the project.

Perhaps, at this point digression is necessary to comment on various possible evaluations (monitoring and quality control activities) that might be engaged in. The first major kind of evaluation we refer to as "formative." Formative evaluation takes place during the process of the program in order to provide information assuring that the activity is being conducted properly -- as planned, or in accordance with some rational system. Two kinds of information are obtained during the formative evaluation. These Alkin has referred to as implementation and progress information (Evaluation Comment, 1970, 2(3)) In obtaining the former, the question is to what extent the program (in this case a research project) has been implemented in the intended manner. For example, has the research plan described in the proposal submitted to the National Board of Education been faithfully followed? The second kind of formative data, progress information, deals with the extent to which desired intermediate goals or outcomes have been achieved. In a research project, implementation evaluation entails examination of the procedures or conduct of the project and progress evaluation involves examination of the intermediate results or findings of the project.

The second major type of evaluation is "summative" evaluation. One purpose of summative evaluation is to facilitate the decision as to whether or not to adopt or approve the results of the activity. These results might be approved for incorporation into future instructional development or as a part of the curriculum plan of the National Board of Education. A second reason for summative evaluation might be to determine whether continuing study of the area is necessary and appropriate.

The appropriateness of conducting either formative or summative evaluation, or both, is dependent upon the research and development strategy. That is, "applied research" based on the "plan" strategy requires formative evaluation, especially for implementation information, as well as summative evaluation. On the other hand, basic research activity based upon "the man" strategy may very likely require only summative evaluation, in order to determine the quality of the project and the performance of the man as a basis for future funding decisions.

The recommendations for improving project monitoring and quality control depend entirely upon the research and development priorities adopted by Byrå L4:1 and the strategies selected for achieving those priorities. Formative evaluation by the L4:1 staff is required to the extent that the funding is for applied research or development and to the extent that it is based upon a plan.

A somewhat more difficult problem relates to potential procedures for reviewing and evaluating basic research activities. In many instances these projects are not particularly amenable to formative evaluation. They do, however, require some kind of summative evaluation activity. We would propose that each research report emanating from a project be considered a document suitable for summative evaluation. Yet the problem of evaluating in a thorough, systematic fashion every research report of each basic research project seems to be almost insurmountable. Nevertheless, this point, we are reminded of a concern noted earlier for the provision of better opportunities for in-service training of the junior researchers on projects. Thus we propose as a possibility that each research report emanating from a project be submitted by the National Board of Education for anonymous review by several junior researchers (fil.lic.-degree) at research institutes in Sweden. The reports might either be sent directly to the junior researchers known

to be engaged in similar or related activities or to professors at several institutes each of whom would select a junior researcher to do the review. In some respects this procedure is similar to a "first opponent" analysis and critique of a dissertation.

The proposed procedure has several potential values. In the first place, junior researchers throughout the country would be given a broader exposure to the views of other professors and a first-hand opportunity to examine their works critically. Secondly, when it is deemed appropriate by the National Board of Education, the information provided by junior researchers could provide a basis for comments and discussions with scientific leaders. Finally, consistent and recurring criticisms made by different junior researchers on several research reports from the same project could be weighty evidence for serious discussions about major modifications of basic research projects.

E. Coordination of Projects

This section deals with the problem of developing interrelationships between similar projects. When vast amounts of money are spent on many activities which are quite similar, there is a need to develop interrelationships. This need appears to exist in the case of several research projects in Sweden.

We see increasing evidence that the National Board of Education, through Byrå L4:1, has been paying considerable attention to project coordination. For this fine work, project officers at L4:1, in particular, are to be lauded. But despite the considerable progress in this dimension, there is still a significant need for better data usage. There are a number of large-scale data collection projects currently under way, and many longitudinal studies. Data from these projects are frequently underanalyzed. Often the investigators are interested in only a certain set of questions, whereas with slight modifications or revisions the data could

very possibly be used for other research purposes. Such coordination between the data collection and analysis activities of various projects offers the potential for considerable savings not only in money and researcher's time, but also in the time spent by test takers and respondents to questionnaires.

There are several possible recommendations that we might make at this point. On the one hand, Byrå L4:1 might experiment with the possibility of funding joint data collection for related projects or for projects which seem to have the same or similar data needs. Thus, funding might be provided to two investigators with a portion of the funding retained for joint use in data collection.

We discussed earlier the possibility of funding multi-investigator projects at the same institution, when the individuals are studying different but related questions and relying heavily on much the same data. We believe this to be another feasible way of promoting coordination between projects through their national funding. The purpose of this recommendation is to reduce the isolation of individual projects in order to create more meaningful research results. That is, the major motive is to enccurage a sense of interrelatedness in research by promoting the development of coordinated projects not only at the same institution but also among institutes throughout Sweden.

F. Dissemination

The dissemination of research and development findings bears an important relationship both to educational policy at the national level and to the work of the individual teacher. Research and development findings should bear a close relationship to, and have influence upon, the educational decisions of other operational bureaus of the National Board of Education. Also, research findings and development products must be made available, in usable form, to those who are actively engaged in the teaching enterprise.

We suppose that the prime audience for basic research is comprised of other scholars in the field and that the major research journals serve as the prime mechanisms for disseminating such research. Since Swedish educational researchers are well-known internationally, they have apparently been doing an excellent job of disseminating basic research findings. Applied research findings are also in part disseminated through the same mechanism. Additional means of communication are available, however, some of which are used, and they should be noted. We feel, for example, that the School Research Newsletter is extremely effective. It communicates in a fine way to researchers at other institutes the projects under way at Byrå L4:1. Unfortunately, one only reads about projects in progress. Projects seem only to begin or be in progress; they never seem to end. In part this is a function of the process of providing continuing funds for research: at the completion of a specific research project, the scientific leader is usually writing up his next project for the School Research Newsletter.

It is understandable that scientific leaders do not view the readers of the Newsletter as a particularly prestigious audience for the dissemination of their findings, and that they would prefer to discuss current projects rather than completed activities. In this regard we would propose that a separate series be established by Byrå L4:1 to present summaries of the results and findings of every study sponsored by the National Board of Education. This series, perhaps called School Research Abstracts, should be given wide-scale dissemination to research institutes in Sweden, as well as to other countries, with copies of the actual research reports made available at the libraries of all institutes in Sweden. We feel that this recommendation would be relatively inexpensive to implement, yet provide a worthwhile device for improving communication of research findings.

Dissemination related to the development area presents quite different problems. It appears that instructional materials developed under grants from L4:1 are at present readily acceptable to the main agents for dissemination (book publishers). Thus, there does not appear to be any difficulty with respect to the dissemination of specific marketable products. However, when the product in development (or even in applied research) is not a marketable entity, then the dissemination problem is of quite another magnitude. This was discussed by Passow in 1968 when he suggested an examination of AERA's series, "What Research Says to The Teacher." We have no particular recommendations in this regard beyond those activities currently under way.

Many of the suggestions presented in this paper are not original. Some suggestions were inspired by other publications; others are a consequence of comments made in discussions. For example, we would subscribe heartily to a comment made by Dr. Sixten Marklund in which he noted that one area in which Byrå L4 would like to extend its activities is in the development of research summaries and research syntheses of special topics based upon the work performed by various projects within Sweden. The notion of having research syntheses performed at the national level and widely disseminated, presenting a picture of the state of the art with respect to a particular area, seems to us to be an extremely fine one. It would, however, require some small addition of personnel to Byrå L4.

III. Further Comments on Research

The educational research work currently being undertaken in Sweden seems generally to be of high quality. The problems that have been attacked appear to be relevant, and in general the procedures and methodology are at the desired

level of sophistication. One can find cases where the methodology employed has not been sufficiently rigorous to obtain the kinds of results anticipated. One can find instances in which the measures used have not been chosen with sufficient care to represent adequately the exact objective or dimension stipulated in the proposal. But these problems are found in all countries--in all research programs--and it is appropriate to say that the quality of the research conducted in Sweden is predominantly high.

However, one domain where deficiencies can not be dismissed as "minor" and where in our estimation there is a problem that requires correction is the conceptual grounding and theoretical framework of research projects. In part, this problem may stem from the ease of broad-scale data collection in Sweden by virtue of a centralized data system at the national level. In part, it may stem from a long tradition in Swedish research of utilizing broad-scale data analysis and longitudinal studies. Perhaps the increased availability of research funds in the past few years has made it possible to do "exploratory research" without adequately developing the conceptual framework for the research that will be undertaken.

Sure, hypotheses should often be modified on the basis of insights from data. Certainly, theorems will be revised drastically as a consequence of the data collection and analysis. But, massive correlational fishing-trips are no substitute for the kind of thinking, conceptualization, and hypothesis generation that necessarily must precede data collection and analysis.

In describing his project, a representative at one institute, told the authors of this paper that "the pattern is to collect data -- there are a lot of different studies that we can make from the data we have." It would seem that, they ought to know what those studies are going to be before the data is collected. So, too, should Byrå L4:1 have a basic understanding of the research hypothesis, the conceptual framework, the raison d'etre of a study before funding it.

It is conceivable that the authors have misunderstood the intentions of some projects and have not understood adequately the theoretical grounding of these and other projects. But, we urge the National Board of Education to review the conceptual frameworks of continuing projects and to examine more fully whether the conceptual framework has been adequately established prior to funding future research projects.

IV. Further Comments on Development

There are several different kinds of development activities that might be engaged in. On the one hand, attention might be focused upon curriculum development in which the priorities relate to establishing the intended outcomes or desired ends of instruction. We view the process of curriculum development as a multi-level activity starting from the statement of broad curricular objectives emanating from national goals and terminating at more highly specific levels. The second kind of development activity may be referred to as instructional development. Instructional development may have as its concern either the development of instructional products (such as books, materials, sequences, etc.) or the development of specific instructional systems. By instructional systems we refer to a complete instructional plan, including specified instructional products chosen on the basis of the likelihood that in combination and/or sequence they would achieve curriculum objectives, given a unique set of frame factors.

Are development activities the function of Byrå L4:1? We are not in a position to make that specific judgment. However, our observations have convinced us that there is a considerable need for systematic development work in Sweden. Obviously, development work in both curriculum and instruction is taking place within the branches of UA. But the job is too great, and the manpower neither sufficient nor appropriate for the task. The curriculum

development work that has taken place thus far, while of high quality, is by and large not at the level of specificity required for instructional product development. Thus, one finds, for example, in a project in Byrå L4:2 and in various of the L4:1 projects that a redefinition and further refinement of curriculum objectives take place in order to perform the instructional product development.

We have found several excellent examples of instructional product development projects. Some of the best materials on the market or about to be placed on the market in the next year or two have started out as L4:1 projects. This is to the credit of the L4:1 projects: we believe that it has taken considerable imagination (perhaps even some resistance to the prevalent preference among the research establishment) to support this development work.

But there are problems! First, there is a tendency to regard most favorably those development projects which look like research projects. That is, the questions most frequently asked are: Was an experimental design used in testing? Was a control group used? How sophisticated was the statistical analysis? In part this problem of asking research questions about development projects seems to stem from the fact that there is apparently no clear differentiation between projects in terms of their functions. This was alluded to earlier when we discussed the need for specifying functions and priorities of the research and development activities of Byrå L4:1. Projects are viewed as projects; they are not presently viewed as being of different types having different kinds of objectives, and therefore involving work to be done in different ways and to be judged differently. The enterprise of product development and evaluation is unique -- it is just as scientifically rigorous as research activity but requires a different set of tools.

Some of the questions asked during the development phase are as follows:

What are the objectives to be achieved?
What procedures have been used in the past to achieve these objectives?
Under what sets of frame factors have various of these procedures been found to be successful in achieving the objectives?
What have been their various strengths and weaknesses?
What does research tell us about appropriate strategies that might be used for these kinds of objectives?
What does research tell us about appropriate instructional strategies that might be used for this discipline?
What is known about the discipline itself in terms of the structure of its knowledge?

Various evaluation activities are appropriate in considering a development project. Formative evaluation takes place during the course of the development. It deals with a consideration of the problems encountered in implementing the materials. Another consideration within formative evaluation of development activity is the examination of the extent to which interim or short-term objectives have been achieved using the materials. One purpose of formative evaluation is to provide feedback to the product developers in order to allow them to make modifications of the materials based upon actual deficiencies.

A second kind of evaluation activity we referred to as summative evaluation. The concern of summative evaluation in product development is the extent to which a product achieves the objectives stipulated, given various different sets of frame factors. That is, an attempt is made to indicate as fully as possible the specifications of the products in regard to achieving the objectives within the bounds of various frame factors. The investigator is concerned with answering the questions: Under what conditions will this product work? For which objectives? At what level of achievement? For what sets of frame factors?

Comparative evaluation (so called experimental-and control-group research) is another endeavor -- it is not necessarily a part of product development and evaluation. If there is <u>another</u> product which has precisely the same sets of objectives as the product under development or which has a sufficiently large

set of overlapping objectives, it may be worthwhile to do a comparative evaluation in which overlapping and unique objectives are specifically designated.

To specify the unique functions and priorities of research and development in Sweden has implications far beyond those related to the selection of projects. For if, as appears to be the case, the lack of specification causes all projects to be judged on the same set of standards or by the same kinds of criteria, we view the situation as a particularly restrictive deficiency in the system.

One further, related problem has to do with the competition among docents for professorships. There seems to be little payoff for doing development work in terms of achieving professor positions. For example, we have seen instances where qualified scientific leaders who have been engaged in development have been encouraged by their colleagues to do something more sophisticated (of greater statistical complexity) if they aspire to achieving a professorship. Often, what scientific leaders engaged in development are doing seems to be perfectly appropriate to the objectives of their projects. To seek "academic research respectability" on development projects is surely to destroy the projects.

On the other hand, development is not an activity that can be effectively supervised by poorly qualified researchers. Development demands the competence of qualified scientific leaders who have a fundamental academic grounding -- docent competence. But, the present rewards system runs counter to the need. One possible external reward is financial but we are led to believe that current thinking in Sweden is that individuals should not achieve financial gain as a consequence of a nationally-supported development activity.

We propose the establishment over the course of several years of a small number of development centers attached to existing research institutes to be

headed by individuals with permanent associate professor positions. We believe individuals will be encouraged to engage in development work when they recognize that there are professorial positions of permanence available for this line of activity. Since these positions should not be considered as stepping stones to the research professorships, we would specify that Ph.D. (docent) competence be a basic prerequisite for the positions, but that major judgment between candidates be based upon demonstrated competence in development and evaluation activities and not on research competence.

We are aware that there has been discussion in Sweden relative to various research needs in special areas and that suggestions have been made and negated relative to having professorships related to specific topics. We recognize that the above proposal recommending the creation of an associate professorship for development may be criticized as running counter to the present policy of not stipulating the subject matter of chairs. But we would disagree with this criticism, because the basis for the proposed position is not the subject matter to be considered but rather the nature of the R & D priority to be attacked. Indeed, using the present criteria one might accurately state that there are now 12 professorships of educational research in Sweden and all that we suggest is the addition of several associate professorships of educational development.

V. Final Comment

Since specific sources of information and observed instances are not identified, the generalizations in this report are admittedly open to the charge of not being documented by evidence. Had we been engaged in a confidential investigation of the system, we would of course have been obligated to provide specific substantiation for each conclusion. But, on the contrary, we undertook our observations,

conversations, and inquiries with the understanding on our part, and with assurances to our gracious hosts and esteemed colleagues throughout Sweden, that we were not engaged in an investigation, but rather in a sincere effort to learn, exchange views, and form impressions which might give rise to some helpful suggestions. The informed reader will obviously reject any suggestions pertaining to conclusions which are apparently based on misinterpretations or limited observation.

Some of the shortcomings which we note are equally to be found in our own country, and we believe that some of our recommendations are equally applicable there. But the fact that such shortcomings go uncorrected in the U.S. does not mean that the recommendations are not valid for Sweden. By the same token, the fact that something is done in the U S. does not mean that it should be done in Sweden. Indeed, due to a number of factors, Sweden is in an excellent position to make refinements in its educational R & D system which will make it a model for the rest of the world. We hope that in the refinement process some of our suggestions will prove helpful, and we conclude by summarizing them here:

1. Explicate priorities for basic and applied research and development.
2. Fund all professors and some docents for basic research of greatest interest to them.
3. Establish centers or coordinated multi-investigator projects for applied research on broad problem areas.
4. Strengthen technical support by sharing services.
5. Schedule inter-visitation program for institute professors.
6. Carry out systematic "formative" or progress evaluation of projects.
7. Involve junior researchers in anonymous review of research reports.
8. Initiate a School Research Abstracts series.
9. Insist on explicit conceptual frameworks for projects.
10. Set up some development centers headed by permanent associate professors of development.

October 1971 1971:26

School Research: Budget Proposals by the Board of Education for 1972/73

Expenditure during the budget year 1972/73 on research commissioned by the National Board of Education from the various school research institutes is expected to amount to Skr. 14.97 million (an increase of Skr. 3.6 in relation to the allocation for 1971/72). This amount is less than was calculated by the Board for similar purposes in their budget estimates last year.

The new projects proposed for 1972/73, like those of the past few years generally, are predominantly concerned with handicapped and low performance categories, pre-school age groups, adult education, personal development and more direct measures of support for curricular development. Certain of these new projects will be concerned with models for the teaching of immigrant children, self-awareness in slow learners, school affairs in thinly populated areas, study options and courses of study in municipal adult education, the development of egalitarian attitudes during school age and studies in curricular theory.

The relation between current projects and projects planned to commence during 1972/73 is shown in the following two tables. The figures refer to Skr. 1 000.

Programme	Current projects	New projects	Total exc for salary costs	Total incl salary costs
Aims	810	330	1 140	1 300
Pupils	1 405	954	2 359	2 770
School organization and environment	1 295	270	1 565	1 840
Teaching	1 226	1 160	2 386	2 850
Teachers and other school personnel	475	-	475	550
Teaching materials	1 480	-	1 480	1 700
Individual evaluation	550	190	740	870
System evaluation	735	100	835	965
Research production	1 650	130	1 780	2 125
Total	9 626	3 134	12 760	14 970

Level or educational sector	Current projects	New projects	Total exc for salary costs
No specific level or sector	2 375	130	2 505
Handicapped or low performers	1 016	325	1 341
Pre-school	410	160	570
Several levels and sectors	200	94	294
Comprehensive school	2 630	1 610	4 240
Upper secondary school, general education	755	90	845
Vocational education	295	200	495
Adult education, folk high school	400	425	825
Teacher training	1 595	100	1 695
Total	9 626	3 134	12 760

Planning of new research and development projects will to an increasing extent be integrated with preparations for the compilation of a development plan for the school system. The Board's experience of the pilot

studies conducted by the PLANS (planning systems for the school system) working committee may come to play an important part in this context.

The Board are progressively developing forms of regular contact between research activities and users of research and development results in the school system, including the various units of the Board itself. Work has begun at the Board on alternative means of achieving a wider distribution of research and development results which are of interest to school personnel at different levels. The Board's participation in the experimental documentation activities now in progress at the State Library of Psychology and Education may prove to be a source of new ideas in this respect.

The research commissioned by the Board has been closely associated with institutes concerned with the training of teachers. This procedure has been a useful one and it has also influenced the view taken by the Board of the organization of teacher training research and development not based on training establishments which have access to educational research institutes. Further consideration will be given by the Board to means of establishing links with teacher training research outside the six localities with institutes of educational research. As has been mentioned on a previous occasion, the same will apply to the co-ordination of municipal development work and research commissioned by the Board.

The following table shows the development of the Research and Development appropriation.

1970/71	Expenditure	8 603 000				
1971/72	Appropriation	9 760 000	inc	salary	costs	11 380 000
1972/73	Estimate	12 760 000	"	"	"	14 970 000

General survey of the development of commissioned research

During 1970/71 there were 56 research and development projects in progress at various institutes of the behavioural sciences, above all

at the educational research institutes of universities and schools of education.

Most of these projects are a matter of several years' work, as can be seen from the tables below, which specify first the initial year and estimated year of conclusion of projects in progress in 1971/72, then the estimated number of years taken by projects in progress in 1971/72 and finally the estimated time required for the completion of projects in progress in 1971/72.

Initial year and estimated final year of projects in progress in 1971/72

Estimated final year	Initial year 1963	1964	1965	1966	1967	1968	1969	1970	1971	Total
1976		1					1			2
1975							1	1	6	8
1974		1				1		6	3	11
1973		3	1		2	5	3	3	1	18
1972	2	1	1		2	4	1	5		16
1971								2		2
Total	2	6	2	0	4	10	6	17	10	57

Estimated total duration of projects in progress in 1971/72

Years	No
2	8
3	8
4	18
5	7
6	4
7	2
8	2
9	5
10	2
11	0
12	1
Total	57

Estimated time required for the completion of projects in progress in 1971/72

Years	No
1	19
2	17
3	11
4	8
5	2
Total	57

A total of eleven institutes of the behavioural sciences are at present (1971/72) engaged on research commissioned by the Board. Altogether 57 projects are involved and Skr 8 260 000 (excluding salary costs) are allocated to institutes of psychology and educational research.

Project groups and institutions 1971/72

Locality	Establishment	Institution	No of projects		Allocation (excl salary costs) Sk 1 000	
Malmö-Lund	School of Education	Educational research	14		2 592	
	University	"	2		261	
	"	Sociology	-		-	
				16		2 853
Gothenburg	School of Ed.	Ed research	6		1 094	
	University	"	6		398	
	Total			12		1 492
Stockholm	School of Ed	Ed research	6		1 080	
	University	"	-		-	
	"	Psychology	1		220	
	Pedagogical Centre		1		130	
	Total			8		1 430

Locality	Establishment	Institute	No of projects	Allocation (excl salary costs) Skr 1 000
Linköping	School of Ed	Ed research	3	540
			3	540
Uppsala	School of Ed	Ed research	5	940
	University		1	150
			6	1 090
Umeå	School of Ed	Ed research	6	387
	+ University		6	387
Non-institutional projects			6	468
			6	468
Total			57	8 260
Miscellaneous				1 500
Grand total				9 760

The aims of commissioned research include the following

- to acquire further knowledge of the teaching process, pupil development, teaching, materials etc
- to develop methods for analysing the aims, organization and achievements of school
- to produce prototypes, e g aims documents, evaluation instruments and teaching materials
- to improve resources of competent research personnel and to enhance institutional research and development resources
- to develop contacts and disseminate information regarding the results of research and development work

The results of research and development are published in the form of reports. Research also leads to the contruction of measuring instruments, questionnaires and teaching materials (printed matter and technical aids). Commissioned research also serves to promote personnel training as well as creating an intricate network of personal contacts which is of great value for co-ordination and for the optimum utilization available resources.

Financial survey

To provide a better overall view, research is divided into programmes relating to the documents which generally occur in the planning of education and teaching as regards either a complete system or a brief series of lessons.

Each individual programme can be divided up according to groups of pupils, school levels and educational sectors, e g handicapped pupils, the upper level of comprehensive school or vocational education.

The following table shows the distribution of expenditure (not including salary costs) under item 1 of the Research and Development allocation: school research, as divided in the programme for 1970/71, the estimated distribution of expenditure for 1971/72 and estimates for 1972/73.

Programme	Expenditure 1970/71	Allocation 1971/72	Estimate 1972/73
Aims	1 063	966	1 140
Pupils	780	1 058	2 359
School organization and environment	765	1 169	1 565
Teaching	1 860	1 414	2 386
Teachers and other school personnel	400	465	475
Teaching materials	1 750	1 713	1 480
Individual evaluation	630	805	740
System evaluation	305	655	835
Research production	1 050	1 515	1 780
Total	8 603	9 760	12 760

The entire difference between 1971/72 and 1972/73, i e Skr 3 million (excl salary costs) is expected to go to new projects. Skr 9.6 million are required for the completion in 1972/73 of

projects already in progress in 1971/72 (excluding salary costs). Nineteen new projects are planned. These are divided between the following sectors:

- Handicapped and low performers 4
- Adult education 3
- Pre-school stage 1
- Vocational education 2
- Models and aids for curricular development 9.